Semantic opinion mining of social media for stock market analysis

Introduction

Presented by
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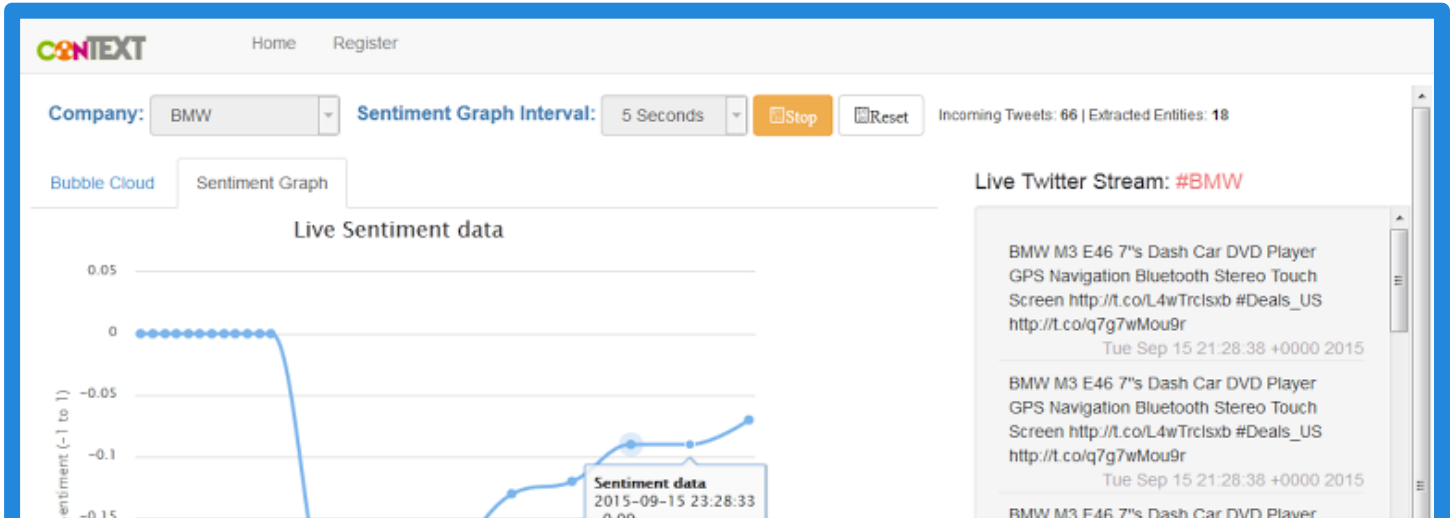
universitätbonn EIS ENTERPRISE INFORMATION SYSTEMS

Previous work...

- Tracking stock market sentiment through the semantic analysis of social media
  - Author: Priyanka Dank - 2014
  - github.com/EIS-Bonn/Theses/tree/master/2014/Priyanka_Dank



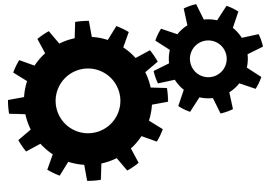
Motivation

- Opinion of the public can be extracted from the social media
- People's opinion towards a company may influence value changes in the stock market
- Stock market movements can be predicted by analyzing the emotional behavior of the people using social media content

Problem

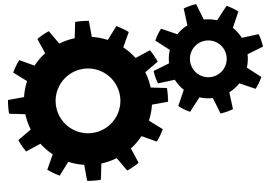
- Sentiment classifiers problems
  - Heterogeneity of posted information
  - Message based analysis
- Sentiment expressed towards an entity such as a Company might not be enough to represent its global opinion
  - Constant release of new products
  - Change of key personnel

Approach/Solution



- Social networks to be analized:
  - **Twitter** and Facebook (in evaluation)
- Entity-based sentiment analysis using semantic web technologies
  - Build an **ontology** to represent companies entities
  - Extraction of Company-specific data from different sources such as DBpedia, Google finance and others.
- Extend ReSA (Real time Semantic Analysis tool by Dr. Ali Khalili)
  - Extend DBpedia spotlight data
  - Process streams from different social networks
  - Replace sentiment analysis module

Approach/Solution - (Contd.)



- 3-class classification: Negative / Positive / Neutral
- Entity-base sentiment classifier
  - Provide sentiment towards given entity (-1.0 /1.0)
- Combined Techniques
  - Combine supervised and unsupervised classification methods.
- Lexical resources
  - NRC Emotion (Twitter specific tokens)
  - MPQA (8,000 words)
  - SentiWordNet (3.0)

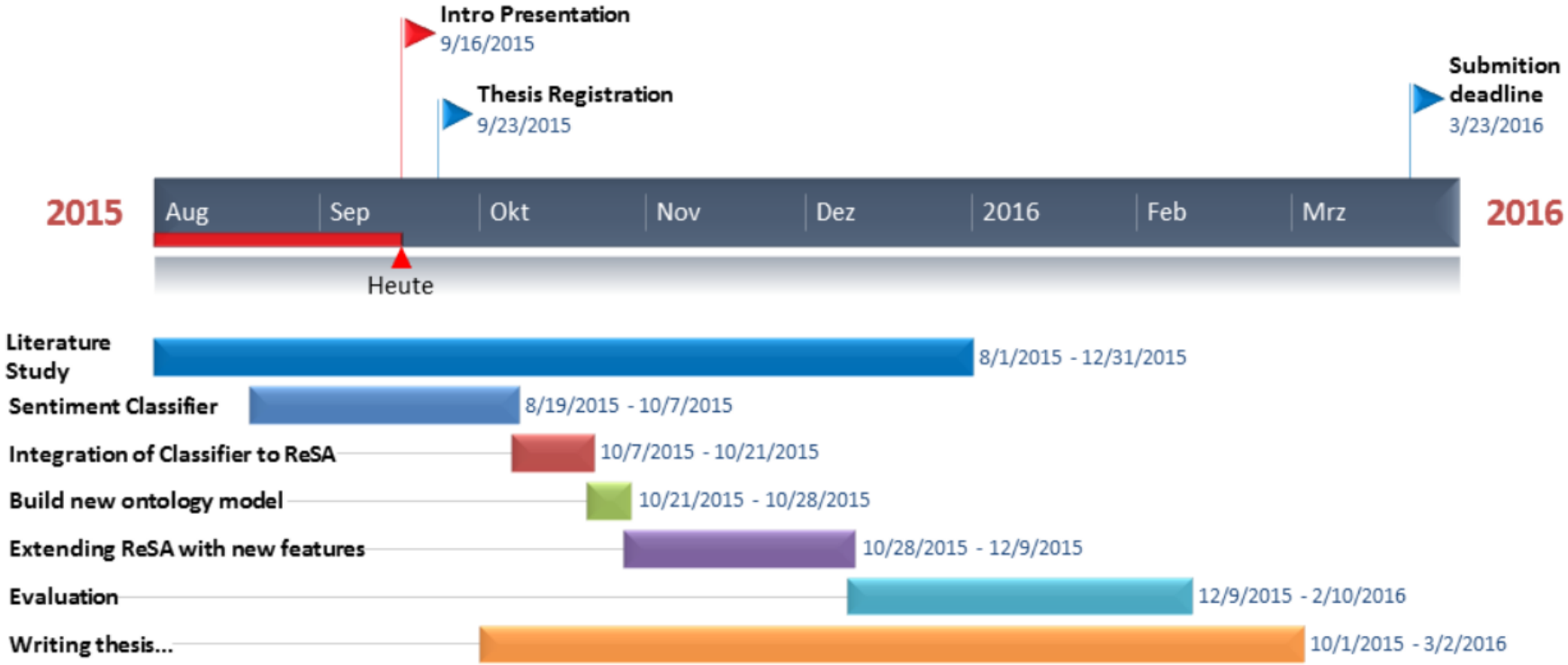
Implementation - Technologies

- Extending ReSA project
  - NodeJS / MongoDB / Twitter API
  - + FacebookAPI / Several Lexicon Libs
- Entity-expansion based on created ontology
  - RDF / SPARQL
  - DBpedia / DBpedia Spotlight

Evaluation

- Sentiment classifier evaluation
  - Annotated evaluation datasets (SemEval competition)
- Find correlations between average sentiment and stock market trend for given entity
  - Independent application recording stock value changes

Time plan


Intro Presentation
9/16/2015
Thesis Registration
9/23/2015
Submition deadline
3/23/2016
2015
Aug
Sep
Okt
Nov
Dez
2016
Feb
Mrz
2016
Heute
Literature Study
8/1/2015 - 12/31/2015
Sentiment Classifier
8/19/2015 - 10/7/2015
Integration of Classifier to ReSA
10/7/2015 - 10/21/2015
Build new ontology model
10/21/2015 - 10/28/2015
Extending ReSA with new features
10/28/2015 - 12/9/2015
Evaluation
12/9/2015 - 2/10/2016
Writing thesis...
10/1/2015 - 3/2/2016

Current status

- Entity-base Sentiment Classifier for Twitter
  - Selection of lexicons to use
  - Classify several entities on a same tweet

- Evaluating different approaches
  - Other supervised classifiers
  - Usage of services such as Sentiment140 or AlchemyAPI

Thank You

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